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The broken eggs examined were all specked and spotted with either brownish black or pale rusty brown, in marked contrast to each other, the coloring matter by sets, however, largely alike.

A pair of the birds, which I shot and mounted in the winter of 1886 at Santa Tomas, Guatemala, measure as follows, in inches :

<i>Sex.</i>	<i>Length.</i>	<i>Stretch of wing.</i>	<i>Wing.</i>	<i>Tail.</i>	<i>Tarsus.</i>	<i>Bill.</i>
♂	22.00	32.00	9.75	8.25	2.00	3.00
♀	16.50	24.00	7.50	5.75	1.70	2.30

ON THE AVI-FAUNA OF PINAL COUNTY, WITH REMARKS ON SOME BIRDS OF PIMA AND GILA COUNTIES, ARIZONA.

BY W. E. D. SCOTT.

With annotations by F. A. Allen.

(Continued from Vol. IV, p. 205.)

178. *Piranga ludoviciana*. LOUISIANA TANAGER.—Migrant and summer resident in the pine forests of the Catalina and Pinal Mountains, where they breed. They first appear in the spring about April 15, in the live oak belt of the Catalinas, and remain in numbers for about two weeks; they are to be seen as late as May 20. After this they are absent for about four or five weeks, when they return in much greater numbers than in the spring, and remain till late in September, being most abundant in the latter part of August and the first two weeks of September. This is in the Catalinas at an altitude of about 4000 feet.

They undoubtedly breed in the pine forests of the Catalinas, for the birds observed returning in late July are first adult males in full though very worn plumage, followed in a few days by the females and immature plumaged birds of the year. They soon congregate in large flocks, as many as fifty often being together, and at this time of year their food seems to be almost exclusively wild berries and small fruits of various kinds, particularly a kind of grape. They were noticed in the pine forests of the Catalinas as early as April 24 (see Auk, Vol. II, No. 4, p. 354, October, 1885), and my latest record of them in the cañon near my house was September 29, 1884, when they were observed in small numbers, all apparently young birds of the year.

179. *Piranga hepatica*. HEPATIC TANAGER.—Observed only in the oak region of the Santa Catalinas (5000 feet), where they are summer residents, breeding late in the season, from May 6 to 9, and remain till about September 10.

A pair taken July 12, 1884 (♂, No. 533, ♀, No. 534), were breeding, the female having finished incubating only three or four days before. The nest was on the outer branch of a live oak, and was an entirely similar structure to that of *Piranga erythromelas*, and contained three young birds.

From specimens taken early in September it appears that the adult male of this species assumes in fall a plumage very like that of the adult female. I have also found males in a similar though not identical plumage, mated and breeding late in June, which would seem to indicate that the brilliant plumage of the male is not acquired until the birds are at least two years old. The males noted breeding in the greenish yellow plumage were quite as accomplished songsters as the brilliant males, but I think the females do not sing.

180. *Piranga rubra cooperi*. COOPER'S TANAGER.—A common migrant and summer resident about Tucson, Riverside, Florence, and at Mineral Creek, as well as in the San Pedro valley. They seem more rare than either of the other species of Tanager in the oak region of the Catalinas, and though a few breed, for they were observed all through spring, summer, and early autumn, no nests were discovered. At this point, altitude 4000 feet, the earliest record of the spring arrival is May 2, and the latest birds observed in fall were seen September 10, when one was taken and two others seen.

Of this subspecies I am also inclined to think that the males do not assume the brilliant phase of plumage till at least two years old, as I have taken yellowish colored males in June in full song and, from the condition of the testes, evidently breeding.

Of the typical *Piranga rubra* I have also a specimen of an adult male bird taken near Tarpon Springs, Florida, in October, that is in the same brilliant plumage as in the spring. This bird had evidently only finished the moult a short time, as the feathers were wholly unworn and very brilliant. I also have notes of two other adult male birds of this species in the red plumage seen by me near the same locality in October, 1886.

In conclusion I may summarize my opinion on this subject by stating that I think that the fully adult males of *P. erythromelas* and *P. hepatica*, after having assumed the brilliant plumage of the breeding season, in the fall assume a plumage similar to that of the adult female, but that *P. rubra* proper, and probably the subspecies *cooperi*, once having assumed the brilliant plumage, wear it always. In the collection is a Tanager (No. 2434, ♂ ad., taken in the Catalinas, altitude 4000 feet, on May 6, 1885), that I can only refer to this subspecies. It has no regular pattern in the coloration, but is curiously marked at random with dark green, light pink and golden yellow in patches. The plumage is not at all worn, and the bird can only be regarded as a freak or anomaly.

181. *Progne subis*. PURPLE MARTIN.—Observed rather uncommonly about Tucson.

182. *Petrochelidon lunifrons*. CLIFF SWALLOW.—Observed in numbers about Riverside in April, 1882.

183. *Chelidon erythrogaster*. BARN SWALLOW.—Common migrant throughout the region, and breeds rather sparingly in the Catalinas, at an altitude of 5000 feet. The species seems much more abundant as a fall than as a spring migrant. On October 12, 1884, they were abundant in the Catalinas, at an altitude of 4000 feet.

184. *Tachycineta bicolor*. TREE SWALLOW.—Observed only about Tucson in early spring. They were noted in small numbers on March 10, 1886. Mr. Herbert Brown tells me he regards the species as rare.

185. *Tachycineta thalassina*. VIOLET-GREEN SWALLOW.—In the Catalinas this is the commonest of the Swallows, but, curiously, at the lower altitudes (4000 feet) in the spring it is rare or does not occur. In the spring of 1885 I found it common in late April on the summit of the mountains in the pine woods, but though I had looked for it carefully all the preceding six weeks at the altitude of my house I only saw a single individual, on March 14. In the late summer and fall from August 15 till October 7, it was common in the region near my house. It probably breeds in the pines of the Catalinas in numbers (see Auk, Vol. II, No. 4, p. 354).

186. *Clivicola riparia*. BANK SWALLOW.—“Breeds about Fort Lowell” (*Herbert Brown*). I have no records of its occurrence except at this point, where I saw it in May and June, 1884.

187. *Stelgidopteryx serripennis*. ROUGH-WINGED SWALLOW.—“Rather rare about Tucson, arriving about the middle of March” (*Herbert Brown*). Mr. Brown very kindly allowed me to examine several specimens of this species in his collection, taken near Tucson.

188. *Ampelis cedrorum*. CEDAR WAXWING.—Mr. Brown has specimens of this species in his collection, taken by Mr. Nelson near Tucson, in May and June. I have no notes of its occurrence at other points in the region under consideration.

189. *Phainopepla nitens*. PHAINOPEPLA.—This species has been discussed at some length (see Auk, Vol. II, No. 3, pp. 242-246, July, 1885, paper on ‘Breeding of Some Arizona Birds’), and there is little to add here. I met with it at every point visited by me up to an altitude of about 5000 feet. It is migratory, except about Tucson and in the region to the southward, and here only winters in small numbers. It apparently breeds throughout its range, raising at least two broods and probably three. In the Catalinas, at 4000 feet, my earliest spring record is April 25, and I have notes of their occurrence here till November.

190. *Lanius ludovicianus excubitorides*. WHITE-RUMPED SHRIKE.—Resident up to an altitude of about 5500 feet. Rather common throughout the year about Tucson, and observed in suitable localities throughout the area under consideration. In the Catalinas (altitude 3700 feet), a nest of this species, taken April 1, 1885, contained five eggs almost ready to be hatched. I think only one brood is raised here.

191. *Vireo gilvus* [swainsoni. WESTERN] WARBLING VIREO.—Common spring and fall migrant, and a few breed in the Catalinas at as low an altitude as 3500 feet. All my notes in regard to the species were made in the Catalinas, which is the only point where I have met with it. Mr. Brown has found it as a migrant about Tucson. In the Catalinas, altitude about 4000 feet, it arrives about the middle of April and remains until about October 1, being most common during the first two weeks of September. In 1885, on June 9, I took a nest of this species near my house, which contained two eggs nearly ready to hatch. The nest was similar to that of the species in the East in every way (♀ parent, No. 2779). For an account of the occurrence of this species in the pine region of the Catalinas, see Auk, Vol. II, No. 4, p. 354, October, 1885.

[A series of upward of twenty specimens of the Western Warbling Vireo in Mr. Scott's collection makes evident the propriety of restoring this form to formal recognition in our nomenclature, as Mr. Ridgway has recently done in his 'Manual' (p. 471). The characters of smaller size, slenderer bill, and more olivaceous coloring below are well borne out by the series before me.—J. A. A.]

192. *Vireo solitarius cassinii*. CASSIN'S VIREO.—All the data in regard to this subspecies were collected in the Santa Catalinas, altitude 4000 feet and above. My notes indicate this to be a rather uncommon spring and fall migrant. Observed in spring from April 18 to May 15.

[Of twelve specimens of this subspecies in Mr. Scott's collection seven were taken in April and May (April 6 to May 10), and five in September and October (Sept. 10 to Oct. 7), indicating, as Mr. Scott says, that it occurs merely as a spring and fall migrant. The fall specimens, as would be expected, are much more olivaceous than those taken in spring.—J. A. A.]

193. *Vireo solitarius plumbeus*. PLUMBEOUS VIREO.—All my experience with this subspecies was obtained in the same locality as the last, where it had about the same distribution and time of spring arrival, except that it was much commoner, and particularly so in the late summer and early fall months. That it breeds at this point cannot be doubted, though at an altitude in the mountains greater than 7000 feet, for I have met with old birds in worn plumage as early as the middle of July. I also took a single example of the species in the pine woods of Mount Rice, Santa Catalinas, altitude 10,000 feet, April 30, 1885 (No. 2347, ♀).

[Mr. Scott's sixteen specimens of the Plumbeous Vireo were all but three taken in May, the earliest date being April 30, and the latest dates July 17 and 19. The July specimens are in exceedingly worn plumage. Of the thirteen May specimens, about one half were taken during the first week, and the remainder during the last week of this month (May 23-30); and the contrast between the condition of the plumage in the two series is striking, through the much more abraded state of the feathers in the birds taken near the close of the month, indicating that the birds were probably summer residents and breeding.—J. A. A.]

194. *Vireo huttoni stephensi*. STEPHENS'S VIREO.—The only specimens of this subspecies that have come under my observation are the two

that I have already recorded from the pine region of the Santa Catalinas (see Auk, Vol. II, No. 4, p. 354, Oct., 1885), and an additional specimen procured on Mount Rice in the same range on April 30, 1885. Mr. Brown told me of a single specimen taken by him in the Quijotoa Range, in late February, I think. This bird is now in the collection of Mr. H. W. Henshaw.

195. *Vireo belli pusillus*. LEAST VIREO. — Common migrant and summer resident, breeding throughout the region up to an altitude of 4000 feet. In the Catalinas they arrive about the 25th of March and by April are common. They are apparently mated on arrival, and at once proceed to build nests and lay eggs. Two broods are generally raised and three eggs are commonly found to form the brood. They leave the Catalinas early, by September 5, but are to be found on the plains about Tucson much later.

196. *Vireo vicinior*. GRAY VIREO. — For the records of this species and its breeding habits I refer the reader to a paper already presented in this journal, entitled 'On the Breeding Habits of Some Arizona Birds' (Auk, Vol. II, No. 4, pp. 321-326, October, 1885).

197. *Helminthophila luciae*. LUCY'S WARBLER. — A common migrant and summer resident in suitable localities, up to an elevation not exceeding 4000 feet, throughout the territory under consideration.

In the Catalina Mountains and in the valleys of the Gila, Santa Cruz, and San Pedro Rivers these birds bred in numbers, being among the commoner species present from late March and early April until the latter part of August. The first arrivals in 1885 in the Santa Catalinas, altitude 3500 feet, were March 29, a male taken and another seen; March 30, one taken and three others seen, all apparently males. On April 1 the arrival was general, when two were taken and many others seen.

The birds on arrival were about ready to breed, and in a very few days nesting was begun. Late in May I took young birds which were shifting for themselves, and some of the adult birds were just laying, so that probably two broods are generally reared.

198. *Helminthophila virginiae*. VIRGINIA'S WARBLER. — The only point where this species was observed was in the Catalinas, and generally at an altitude exceeding 4000 feet. That they breed at this altitude, or a very little higher up on the sides of the mountains, I feel sure, as I took old and young birds during the third week in July, 1884, not uncommonly. The old birds were then moulting. In 1885, in the same general locality, altitude 3500 feet, the first arrival was noted April 16—only one seen, a male (No. 2169).—For reference to the occurrence of this species in the pine forests of the Catalinas, see Auk, Vol. II, No. 4, p. 352, Oct., 1885.

199. *Helminthophila ruficapilla gutturalis*. CALAVERAS WARBLER. — Migrant in the Catalinas at 4000 feet, which is the only point where I have obtained records of its occurrence. Even here I did not observe it during any of the spring migrations, though it was quite common from September 7, 1884, when the first arrivals were noted, until the 20th of that month, after which time it was not observed.

200. *Helminthophila celata lutescens*. LUTESCENT WARBLER.—Rather common spring and fall migrant in the Catalinas, altitude 4000 feet, and it probably breeds in the pine forests of this range in the higher altitudes. (See Auk, Vol. II, No. 4, p. 352, October, 1885.) The first spring arrivals (Catalinas, at 4000 feet) in 1885 were on April 3, and it was quite common until May 6 of the same season. Not seen later. In the fall I observed it in the same locality from September 3 until the first week in October.

201. *Dendroica olivacea*. OLIVE WARBLER.—The only notes of this species which I have, have been already recorded in this journal. (See Auk, Vol. II, 1885, pp. 172 and 352.)

202. *Dendroica æstiva* [morcomi. WESTERN] YELLOW WARBLER.—A rather common migrant and summer resident throughout the region, and found breeding in the Catalinas up to 4500 feet. My earliest spring record is March 30, 1885.

[Eleven specimens in Mr. Scott's collection show this newly named subspecies to have a more than usually satisfactory basis. Mr. Coale founded his separation (Bull. Ridgw. Orn. Club, No. 2, April, 1887, p. 81) of this form apparently on specimens from Fort Bridger, Utah. Judging from his description our Arizona specimens are considerably paler than Utah ones. A female (No. 2331) taken April 27, 1885, is so very pale as to show no decided yellow below, the lower parts being merely pale, soiled, yellowish white, and there is no decided yellowish anywhere except on the top of the head, upper and lower tail-coverts, edges of the quills, and inner vanes of the tail-feathers. The other spring females show a more or less decided wash of yellow over the lower parts, and of greenish yellow above. In one the yellow is a little stronger, and there are slight traces of reddish streaks on the sides of the breast. Both males and females are strikingly different from *D. æstiva* of the East, and the wonder is that the form was not earlier separated, judging by the Arizona specimens.—J. A. A.]

203. *Dendroica coronata*. YELLOW-RUMPED WARBLER.—Not nearly so common as *D. auduboni*, but I think of regular occurrence as a migrant. I have seen several specimens in the collection of Mr. Herbert Brown, of Tucson, one of these being taken on January 28, 1886.

204. *Dendroica auduboni*. AUDUBON'S WARBLER.—A common migrant, and a few probably breed in the pine forests of this region. They winter in small numbers in the valley of the Santa Cruz, about Tucson, and also in the valley of the San Pedro River. (For further references to the species see Auk, Vol. II, No. 4, p. 352, October, 1885.)

205. *Dendroica graciae*. GRACE'S WARBLER.—The only point where I have observed this species is in the pine forests of the Santa Catalinas in the spring. (For details see Auk, Vol. II, No. 4, p. 352, October, 1885.) A pair that were apparently mated and about to nest, were taken in the pine forests of Mount Rice, Catalina Range. April 30, 1885. They are catalogued as No. 2349 ♂, and No. 2348 ♀, in the collection made by me in this region.

206. *Dendroica nigrescens*. BLACK-THROATED GRAY WARBLER.—

This species I found quite commonly as a migrant in the Catalinas, and it breeds rather rarely in the same range at an altitude exceeding 4500 feet. They arrive late in March (Catalinas, 4000 feet), and are not very common during the spring migration. A few are to be noted at a little higher elevation all through the summer months, and in the early fall their numbers are very appreciably augmented. They remain in this same locality till about the first week in October. (For reference to their occurrence in the pine forests of the Catalina Range, see Auk, Vol. II, No. 4, p. 352, October, 1885.) On June 15, 1885, I took two fully fledged young of this species in the Catalinas at a little above 4000 feet. They are catalogued, "*♂ juv.* 2809, *♀ juv.* 2810."

[These two examples, and two others taken July 12, do not appear to differ in color or markings from birds of the year killed in October.—J.A.A.]

207. *Dendroica townsendi*. TOWNSEND'S WARBLER.—Found only as a migrant in the Pinal and Catalina Ranges. The following are the records transcribed from my journal:

"Mineral Creek, Gila County, altitude 5000 feet, took *♂*, No. 153, November 2, 1882. The only representative of this species observed here."

"Catalinas, 4000 feet, September 8, 1884, one seen, the first of the fall migration. Same locality, September 28, 1884, took *♂*, No. 931, the only one seen. September 29, took *♂*, No. 957, and saw several others—this at about 3500 feet. Same locality, May 6, 1885, general arrival, and the first seen this spring. They were quite common in the oak belt, altitude a little over 5000 feet. Took four and saw several others."

208. *Dendroica occidentalis*. HERMIT WARBLER.—Among the rarest Warblers of the region apparently. I have met with it only on one occasion—September 29, 1884, in the Catalina Range, altitude 3500 feet,—when I took two, both males (Nos. 958 and 959), and saw two others.

209. *Seiurus noveboracensis notabilis*. GRINNELL'S WATER THRUSH.—In the Catalinas, at an altitude of about 3500 feet, on September 2, 1884, I took an adult female Water Thrush (No. 780), and on the following day an adult male (No. 797), both of which I refer to this subspecies. These are the only examples I have met with and I did not see any specimens in Mr. Brown's collection.

210. *Geothlypis macgillivrayi*. MACGILLIVRAY'S WARBLER.—A rather common migrant, and a few probably breed in the Catalinas, as I have taken young birds early in August. After the 9th of this month they were not rare. They arrive early in May and remain till the last of September, the latest record I have being the 25th of that month. These observations were made in the Catalina Range, altitude 4000 feet. Mr. Brown regards it as a rather common migrant about Tucson, where I also saw it late in April, 1884, in numbers.

211. *Geothlypis trichas occidentalis*. WESTERN YELLOW-THROAT.—"A rather common migrant, and breeds about Tucson, but is not found in winter at this point." (*Herbert Brown*.) Mr. Brown also tells me that it arrives in the vicinity of Tucson about the first week in March, and remains in numbers late into October, and is occasionally seen in the early part of November.

[I find a single specimen in fall plumage in Mr. Scott's collection, labelled as follows: "Catalina Mill, 11 Oct., 1883. ♀, 148."—J. A. A.]

212. *Icteria virens longicauda*. LONG-TAILED CHAT.—Common migrant and summer resident in suitable localities up to an altitude of 4000 feet throughout the region. In the Catalinas, altitude 3000 to 4000 feet, it arrives early in May, about the 2d to 5th, and remains till about the 20th of September, but by the middle of that month most of the representatives of the species have left this point.

213. *Sylvania pusilla pileolata*. PILEOLATED WARBLER.—Rather common migrant, particularly in fall. Frequents the neighborhood of streams and damp places. It is not improbable that a few may breed at high altitudes in the Catalina Range. This inference is made from the very early return in fall to the region most studied in these mountains, altitude 3000 to 5000 feet. In the Catalinas, between the elevations just indicated, the species is rather uncommon in the spring, arriving during the last week in April. By the first of June they are no longer to be found, but the first of the fall migrants arrive about August 1, and by the middle of the month they are common, remaining until late in September, and being at times during that month very abundant.

214. *Setophaga ruticilla*. AMERICAN REDSTART.—The only record made of the occurrence of this species was the capture of an adult male in the Catalina Mountains, altitude 4500 feet, August 12, 1884. Mr. Herbert Brown has also taken it on one occasion near Tucson in spring. So far as I am aware these are the only records for the Territory of Arizona, and in the region here treated the bird must be considered rare.

215. *Setophaga picta*. PAINTED REDSTART.—This species I have met with only in the Catalina Range, and at an altitude exceeding 4000 feet. It is apparently most abundant as a summer visitor in the pine forests of these mountains, though I found them breeding as low down as five thousand feet in the evergreen oak belt. This was on two occasions, the young having just left the nest both times. The birds seem to prefer the vicinity of water, and are not to be met with far from such localities.

As migrants, at the lower altitude, when they occur, they are quite rare in the spring, but not at all uncommon in the fall.

In the Catalinas, altitude 4000 feet, the earliest spring arrivals that I have noted were on March 24, 1885, when one was taken and another seen. These were all that were noted at this point, or outside of the pine forests that spring. (For record of occurrence in the pine region, see Auk, Vol. II, No. 4, p. 353, October, 1885.) The species is frequent at the lower altitudes through September, but by October 1 all have apparently gone.

216. *Cardellina rubrifrons*. RED-FACED WARBLER.—This species was met with only in the pine forests of the Catalinas, where it was common late in April, 1885 (see Auk, Vol. II, No. 4, p. 353, October, 1885). The only additional notes that I have were made in the pine forests of Mount Rice, in the same range, April 30, 1885, when a few were noted in pairs; but they were very shy.

(To be concluded.)